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10/702,200	11/04/2003	Ryoji Kubo	1232-5191	7121

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EXAMINER
CUTLER, ALBERT H

ART UNIT	PAPER NUMBER
2622	

NOTIFICATION DATE	DELIVERY MODE
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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

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	Application No.	Applicant(s)
Office Action Summary	10/702,200	KUBO, RYOJI
	Examiner	Art Unit
	ALBERT H. CUTLER	2622

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.
- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
  Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *20 August 2008*.
2a)☐ This action is **FINAL**.   2b)☒ This action is non-final.
3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *16 and 17* is/are pending in the application.
  4a) Of the above claim(s) _____ is/are withdrawn from consideration.
5)☐ Claim(s) _____ is/are allowed.
6)☒ Claim(s) *16 and 17* is/are rejected.
7)☐ Claim(s) _____ is/are objected to.
8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.
10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.
  Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
  Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
  a)☐ All   b)☐ Some * c)☐ None of:
    1.☐ Certified copies of the priority documents have been received.
    2.☐ Certified copies of the priority documents have been received in Application No. _____.
    3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
  * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)
1)☐ Notice of References Cited (PTO-892)
2)☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3)☐ Information Disclosure Statement(s) (PTO/SB/08)
  Paper No(s)/Mail Date _____.
4)☐ Interview Summary (PTO-413)
  Paper No(s)/Mail Date. _____ .
5)☐ Notice of Informal Patent Application
6)☐ Other: _____.

DETAILED ACTION

1.   This office action is responsive to communication filed on August 20, 2008.

Claims 16 and 17 are pending in the application and have been examined by the

Examiner.

Continued Examination Under 37 CFR 1.114

2.   A request for continued examination under 37 CFR 1.114, including the fee set

forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this

application is eligible for continued examination under 37 CFR 1.114, and the fee set

forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action

has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on August

20, 2008 has been entered.

Response to Arguments

3.   Applicant's arguments filed August 20, 2008 have been fully considered but they

are not persuasive.

4.   Consider claim 16, Applicant argues the following: In summary, Nakamura fails

to teach the inventive aspects as indicated above, i.e., (1) a color space conversion

operation for the first RAW data is performed in accordance with the start of reading the

second RAW data, (2) the color space conversion for the first RAW data is performed at

the same time (i.e., in parallel) as the white balance integral processing of the second

RAW data (i.e., while the second RAW data are read from the image sensing element),

(3) the display device displays the object image of the third RAW data after the color

space conversion of the first RAW data and the integral processing of the second PAW

data, (4) the white balance calculation device calculates the white balance coefficient of the second RAW data while the display device displays the object image of the third RAW data (i.e., after the parallel processing of the color space conversion of the first RAW data and the white balance integral processing of the second RAW data), and (5) the third RAW data are stored in the first area where the first RAW data used to be stored.

5.   The Examiner respectfully disagrees. Regarding the first argument, the Examiner agrees that Nakamura does not explicitly teach that a color space conversion operation for the first RAW data (i.e. IMAGE PROCESSING 1, figure 8) is performed in accordance with the start of reading the second RAW data (READOUT 2, figure 8). However, this is remedied by Anderson, who teaches of a parallel operation of reading out second RAW data while processing first RAW data, as previously and currently discussed in the body of the rejection of claim 16.

6.   Regarding the second argument, the Examiner agrees that Nakamura does not explicitly teach that the color space conversion for the first RAW data (i.e. IMAGE PROCESSING 1, figure 8) is performed at the same time (i.e., in parallel) as the white balance integral processing of the second RAW data (i.e., while the second RAW data are read from the image sensing element, READOUT 2, figure 8). However, this is remedied by Anderson, who teaches of a parallel operation of reading out second RAW data while processing first RAW data, as previously and currently discussed in the body of the rejection of claim 16.

7.   Regarding the third argument, the Examiner has been unable to find support for the amended limitation that **the display device displays the object image of the third RAW data** after the color space conversion of the first RAW data and the integral processing of the second RAW data in the original disclosure. This is discussed in the 35 U.S.C. 112 rejection below.

8.   Regarding the fourth argument, the Examiner has been unable to find support for the amended limitation that the white balance calculation device calculates the white balance coefficient of the second RAW data **while the display device displays the object image of the third RAW data** (i.e., after the parallel processing of the color space conversion of the first RAW data and the white balance integral processing of the second RAW data) in the original disclosure. This is discussed in the 35 U.S.C. 112 rejection below.

9.   Regarding the fifth argument, the fact that Nakamura may not teach that the third RAW data are stored in the first area where the first RAW data used to be stored is a moot point, as Nakamura is not relied upon to satisfy the limitation of first and second areas of memory. This is remedied by Anderson. Furthermore, Anderson teaches first and second areas of memory (see figure 4B), which alternately store image data such that a first area of memory (Input Buffer A) stores first, third, etc. RAW data and a second area (Input Buffer B) stores second, fourth, etc. Raw data, as previously and currently discussed in the body of the rejection of claim 16.

10.   With respect to the Anderson reference, Applicant argues that there is simply nothing in Anderson including the cited portions that teaches that the color conversion of the first RAW data is performed with the start of reading the second RAW data.

11.   The Examiner respectfully disagrees. First off, Nakamura teaches that color conversion is performed during the image processing of the first RAW data (PC, figure 8, column 7, lines 24-33). Anderson teaches that image processing of the first RAW data is performed with the start of reading of the second RAW data(See figure 4a, column 4, line 59 through column 6, line 3, column 6, lines 38-56, column 8, line 59 through column 9, line 8. Anderson teaches, "Referring again to FIG. 4B, the ping-pong buffers are utilized during live view mode as follows. While input buffer A is filled with image data, the data from input buffer B is processed and transmitted to frame buffer B. At the same time, previously processed data in frame buffer A is output to the LCD screen 402 for display. While input buffer B is filled with image data, the data from input buffer A is processed and transmitted to frame buffer A. At the same time, previously processed data in frame buffer B is output to the LCD screen 402 for display." As one buffer (i.e. the second area) is filled with raw image data (i.e. the start of reading of the second RAW data from the image sensing element), the other buffer (i.e. the first area) is emptied and processed (i.e. first RAW data is readout from the first area), which processing involves color space conversion (See 612, figure 7, column 8, line 59 through column 9, line 8). Anderson teaches that the input buffers A and B alternate between an input cycle and a processing cycle, column 6, lines 8-10.).

12.   Finally, Applicant argues that the apparatus disclosed in Anderson has input buffers for n pieces of RAW data that correspond to a number of input RAW data, and does not have a structure in which two areas are alternately used. Furthermore, Anderson is silent in disclosing the kind of image processing performed during the live view operation, as required by the present invention.

13.   The Examiner respectfully disagrees. Anderson teaches that each buffer holds one image, and that the buffers are alternately filled and emptied (column 6, lines 37-56). Anderson further explicitly teaches the kind of image processing performed during live view operation in at least column 6, lines 19-32.

14.   Therefore, the rejection is maintained by the Examiner.

Claim Objections

15.   Claim 17 is objected to because of the following informalities: Lack of clarity and precision.

       Claims 17 recites, "the apparatus according to claim 17". Upon further examination, it appears that claim 17 is meant to depend from claim 16. Therefore, the Examiner will interpret claim 17 to read, "the apparatus according to claim 16". Appropriate correction is required.

Claim Rejections - 35 USC § 112

16.   The following is a quotation of the first paragraph of 35 U.S.C. 112:

   The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

17.   Claim 16 is rejected under 35 U.S.C. 112, first paragraph, as failing to comply

with the written description requirement. The claim(s) contains subject matter which

was not described in the specification in such a way as to reasonably convey to one

skilled in the relevant art that the inventor(s), at the time the application was filed, had

possession of the claimed invention.

Claim 16 recites, "and said **display device displays the object image of the**

third RAW data after the color space conversion processing for the first RAW data and

the integral processing for the second RAW data, and said white balance calculation

device calculates the white balance coefficient of the second RAW data while **said**

display device displays the object image of the third RAW data after the parallel

processing of the first and second RAW data, and **said memory stores the third RAW**

data in the first area in which the color space conversion of the first RAW data by said

image processing device is finished".

Applicant recites, on page 20, lines 5-7 of the specification, "Photographing

operation of the electronic camera for the third and subsequent images is also the same

as that for the second image." Figure 2 shows the steps of the photographing

operation. First (S200), the electronic viewfinder (i.e. display) is stopped, next there is

an exposure of the image sensor (S201), and finally a white-balance integration is

performed (S204 or S205). Applicant recites, on page 13, lines 13-16, that an image is

obtained in step 201 by driving the shutter (2). This is subsequent to the turning off of

the display in step 200. Therefore, because the operation for obtaining RAW data to be

recorded is performed during an exposure period in which the display is turned off, the data stored in memory is not the same as data displayed as the object image. The Examiner has been unable to find anywhere in the original disclosure reciting that the display displays the RAW data, and that the said RAW data from the display is subsequently stored in one of the areas of memory.

Therefore, the Examiner will interpret claim 16 to read, "and said display device displays the object image after the color space conversion processing for the first RAW data and the integral processing for the second RAW data, and said white balance calculation device calculates the white balance coefficient of the second RAW data while said display device displays the object image after the parallel processing of the first and second RAW data, and said memory stores the third RAW data in the first area in which the color space conversion of the first RAW data by said image processing device is finished".

Claim Rejections - 35 USC § 103

18.   The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

19.   Claim 16 is rejected under 35 U.S.C. 103(a) as being unpatentable over Nakamura et al. (US 6,963,374) in view of Anderson (US 6,847,388) and Taniguchi et al. (US 5,619,347).

Consider claim 16, Nakamura et al. teaches:

An image sensing apparatus ("Digital Camera", figures 1-4, column 2, line 56 through column 4, line 43) comprising:

an image sensing device ("CCD", 303, figure 4) which outputs image data obtained by an image sensing element as RAW data (column 3, lines 50-58);

a memory ("DRAM", 232, figure 4) which has a first area for temporally storing first RAW data obtained in a first image sensing operation of said image sensing device and for temporally storing second RAW data obtained in a second image sensing operation next to the first image sensing operation of said image sensing device (See figure 7, column 7, lines 10-49. First raw image data is written into the DRAM (232) over channel 1. During a subsequent image capture operation, this first raw data is read out of DRAM (232) over channel 2 for image processing, as second image data is written into the DRAM (232) over channel 1.);

a white balance integration device (211a, figure 6A) which integrates at least one of the first and second RAW data for a white balance processing (The white balance integration device (211a) is part of the image signal processor (211, figure 4). The RAW image data is subjected to white balance processing, and then stored into the DRAM (232), column 6, lines 21-26.);

an image processing device (211, figure 4) which performs image processing of the first and second RAW data readout from said memory (The image processing device (211) performs processing such as color space conversion on the RAW data

readout from memory (232), column 4, lines 8-10, column 6, lines 26-36, column 7, lines

24-33.),

a display device ("EVF", 20, or "LCD", 10, figure 4) which displays an object

image during imaging on the image sensing element (The display acts as a "live view

display" (i.e. an object image is displayed during imaging), column 3, lines 16-23.); and

a control device ("main CPU", 21, figure 4) which controls said memory (232),

said white balance integration device (211a), said image processing device (211), and

said display device (20, 10, column 4, lines 1-27. The main CPU (21) comprises the

image processing device (211) which contains the white balance integration device

(211a), a bus controller (218) for controlling the memory (232), and a video encoder

(213) which supplies analog image signals to the display.),

wherein, in case said image sensing device outputs third RAW data obtained in a

third image sensing operation next to the first and second image sensing operations

(See figure 7. Steps 1, 8 and 10-12 comprise a continuous loop. Because of this, it is

clear that third RAW data, fourth RAW data, etc. can be output by the image sensing

device without altering the camera operation.), said control device (21) controls so that,

said image processing device (211) processes a color space conversion for the first

RAW data readout from said memory (232) in accordance with start of

exposure/storage of the second RAW data from the image sensing element (303) in the

second image sensing operation (See figure 8, column 7, lines 24-33. A frame of raw

data obtained by an immediately preceding image (i.e. first image data) is read out of

DRAM (232) and subjected to color space conversion while second image data is

obtained through exposure and storage of the CCD.), and said display device ("LCD",

10) displays the object image (See "Live View Display" on the right side of figure 8.)

after the color space conversion processing for the first RAW data (See "Pc", figure 8)

and the integral processing (See Readout 2, "Pe", figure 8) for the second RAW data

(See column 7, lines 24-49. The LCD exhibits a "Live View Display" after the color

space conversion "Pc" and integral processing "Pe".).

However, Nakamura et al. does not explicitly teach that said memory (232) has a

second area for storing the second RAW image data, each of the first and second areas

of the memory storing the RAW data from the first and second operations alternately, or

that said memory stores the third RAW data in the first area in which the first RAW data

after processing of the first RAW data by said image processing device is finished.

Nakamura et al. further does not explicitly teach that the processing device processes a

color space conversion for the first RAW data readout from said first area in accordance

with start of reading the second RAW data from the image sensing element.

Anderson is similar to Nakamura et al. in that Anderson teaches of a camera

(figures 1-3) with a memory (figure 4a). Anderson also similarly teaches of reading out

raw image data from an image sensor (114, figure 1, column 5, lines 59-64), storing the

data in a memory (530, column 5, line 59 through column 6, line 3), and subsequently

performing color space conversion on the image data (column 8, line 59 through column

9, line 7).

However, in addition to Nakamura et al., Anderson teaches that said memory

(figures 4a and 4b) has a second area (Input buffer, 2, B) for storing the second RAW

image data, each of the first and second areas of memory stores the RAW data from

the first and second operations alternately, that said memory stores the third RAW data

in the first area in which the color space conversion of the first RAW data by said

image processing device is finished, and that the processing device processes a color

space conversion for the first RAW data readout from said first area in accordance with

start of reading the second RAW data from the image sensing element (See figure 4a,

column 4, line 59 through column 6, line 3, column 6, lines 38-56, column 8, line 59

through column 9, line 8. Anderson teaches, "Referring again to FIG. 4B, the ping-

pong buffers are utilized during live view mode as follows. While input buffer A is filled

with image data, the data from input buffer B is processed and transmitted to frame

buffer B. At the same time, previously processed data in frame buffer A is output to the

LCD screen 402 for display. While input buffer B is filled with image data, the data

from input buffer A is processed and transmitted to frame buffer A. At the same time,

previously processed data in frame buffer B is output to the LCD screen 402 for

display." As one buffer (i.e. the second area) is filled with raw image data (i.e. the start

of reading of the second RAW data from the image sensing element), the other buffer

(i.e. the first area) is emptied and processed (i.e. first RAW data is readout from the

first area), which processing involves color space conversion (See 612, figure 7,

column 8, line 59 through column 9, line 8). Anderson teaches that the input buffers A

and B alternate between an input cycle and a processing cycle, column 6, lines 8-10.

Therefore, buffer A is an input buffer during a first phase, an output buffer during a

second phase when second RAW data is written into buffer B, and again an input

buffer during a third phase when third RAW data is output from the sensor an into

memory. Thus, the third image data is stored in the same area (i.e. buffer A) as the

first image data during the third phase, after the first image data is processed during

the second phase.).

Therefore, it would have been obvious to a person having ordinary skill in the art

at the time of the invention to use ping-pong buffers as taught by Anderson in the

camera taught by Nakamura et al. to read out raw image data from the image sensor

concurrent with the processing color space conversion of previous image data, for the

benefit of improving the display speed of the digital camera and preventing the tearing

of the image on the display (Anderson, column 5, line 65 through column 6, line 3.).

Nakamura et al. alone does not explicitly teach that the integral processing

for the second RAW data by said white balance integration device and the color

space conversion for first RAW data by said image processing device processes

are performed in parallel during reading of the second RAW data from the image

sensing element. However, because the white balance integration taught by

Nakamura et al. is performed during the raw data writing ("Pe"), and thus in

parallel with the readout of the second image data (see figure 8, column 7, lines

41-49), the combination of Nakamura et al. and Anderson teaches that that

integral processing of the second image data and the color space conversion of

the first image data are performed in parallel. This is because Anderson modifies

Nakamura et al. such that the image processing of the first image data (which

includes color space conversion) readout from the first area of memory takes

place concurrently with the readout of second RAW image data from the image

sensor (which includes integration) and into the second area of memory, as

discussed above.

However, the combination of Nakamura et al. and Anderson does not explicitly

teach a white balance calculation device which calculates a white balance coefficient on

the basis of the integration result by the white balance calculation, or that the image

processing is performed in accordance with the white balance coefficient calculated by

said white balance calculation device.

Taniguchi et al. is similar to Nakamura et al. in that Taniguchi et al. teaches

performing white balance (column 1, lines 9-15) on image data stored in a picture

memory (12, figure 1, column 9, lines 42-60). Taniguchi et al. also similarly teaches of a

white balance integration device (15, 16, figure 1, column 9, line 63 through column 10,

line 8).

However, in addition to the teachings of Nakamura et al. and Anderson,

Taniguchi et al. teaches of a white balance calculation device ("white balance coefficient

calculating unit", 22, figure 1) which calculates a white balance coefficient on the basis

of the integration result by the white balance calculation (See figure 1, column 10, lines

45-60. The white balance calculation device (22) calculates a white balance coefficient

according to a plurality of factors determined in units 17-21 of figure 1, based upon the

white balance integration of the white balance integration device (15,16). See also

column 10, lines 6-44.), and that the image processing is performed in accordance with

the white balance coefficient calculated by said white balance calculation device (See

14, figure 1, column 9, lines 50-60, column 10, lines 56-60. Image processing is performed by the white balance adjusting unit (14) based upon the white balance coefficient calculated by the white balance coefficient calculating unit (22).).

Therefore, it would have been obvious to a person having ordinary skill in the art at the time of the invention to have the image processing device taught by the combination of Nakamura et al. and Anderson comprise a white balance calculation device and perform white balance processing based upon a calculated white balance coefficient as taught by Taniguchi et al. for the benefit of performing a sufficient degree of white balance adjustment appropriate to a colored picture without any erroneous adjustment or adverse influence due to a high chromaticity region of the colored picture (Taniguchi et al., column 2, lines 40-50).

The combination of Nakamura et al., Anderson, and Taniguchi et al. teaches that said white balance calculation device (taught by Taniguchi et al.) calculates the white balance coefficient for the second RAW data (see above rationale) while said display device displays the object image after the parallel processing of the first and second RAW data. Anderson teaches that parallel processing is performed by utilizing two buffers, column 6, lines 47-56. Anderson teaches that the image data from one buffer is displayed on the LCD (402) as the image data from the other buffer is processed, column 6, lines 47-56. Therefore, an object image is continuously displayed on the display, including any time when a white balance coefficient is being calculated.

20.   Claim 17 is rejected under 35 U.S.C. 103(a) as being unpatentable over

Nakamura et al. (US 6,963,374) in view of Anderson (US 6,847,388) and Taniguchi et

al. (US 5,619,347) as applied to claim 16 above, and further in view of Sasaki (US

6,961,085).

        Consider claim 17, and as applied to claim 16 above, the combination of

Nakamura et al., Anderson, and Taniguchi et al. teaches that said display device

displays the object image after said white balance calculation device calculates the

white balance coefficient (See claim 16 rationale. Anderson teaches of a continuous

display.). However, the combination of Nakamura et al., Anderson, and Taniguchi et al.

does not explicitly teach a defect correction device.

        Sasaki is similar to Nakamura et al. in that image data is collected from the

image sensor (12, figure 1), preliminary processing is performed to yield first image data

(see step 41, figure 7) which is written into a buffer memory (26a, figure 7). Sasaki also

similarly teaches that the first image data is read from the buffer memory (step 42,

figure 7) for additional processing (see column 10, lines 1-57).

        However, in addition to the combined teachings of Nakamura et al., Anderson,

and Taniguchi et al., Sasaki teaches that the apparatus further comprises a defect

correction device which corrects a defective pixel portion of image data when the image

sensing element has a defective pixel (See column 10, lines 21-57. Sasaki teaches that

the locations of defective pixels are stored in memory, and when reading the data

output from the buffer (26a), the defective pixels are corrected.), and that a control

device controls said defect correction device in such a way that said defect correction

device corrects a defective pixel portion of the image data (See column 10, lines 29-31,

lines 37-41.).

Therefore, it would have been obvious to a person having ordinary skill in the art

at the time of the invention to have a defect correction device for correcting defective

pixels as taught by Sasaki correct defective pixels in the image processing device

during the display of the object image as taught by the combination of Nakamura et al.,

Anderson and Taniguchi et al. for the benefit of keeping the influence of a defective

pixel to a minimum and preserving a high-definition image (Sasaki, column 3, lines 1-5,

lines 12-16).

Conclusion

Any inquiry concerning this communication or earlier communications from the

examiner should be directed to ALBERT H. CUTLER whose telephone number is

(571)270-1460. The examiner can normally be reached on Mon-Thu (9:00-5:00).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's

supervisor, Ngoc-Yen Vu can be reached on (571) 272-7320. The fax phone number

for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the

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AC
09/11/2008

/Ngoc-Yen T. VU/
Supervisory Patent Examiner, Art Unit 2622